

Supplementary material

Supplementary Table 1 Univariate analyses of factors correlating with the main comorbid disorders that accompany ascites progression in the total population

Characteristics	HE		HRS		Infection		SBP	
	OR (95%CI)	P-value	OR (95%CI)	P-value	OR (95% CI)	P-value	OR (95%CI)	P-value
Group								
No ascites*	1		1		1		1	
Grade 1 ascites	4.87 (2.21-10.73)	<0.001	19.32 (2.43-153.39)	0.005	2.53 (1.40-4.59)	0.002	4.29 (1.08-16.98)	0.038
Grade 2/3 ascites	5.38 (2.57-11.30)	<0.001	14.02 (1.79-109.90)	0.012	2.89 (1.69-4.96)	<0.001	14.13 (4.21-47.46)	<0.001
Sex								
Female*	1		1		1		1	
Male	0.63 (0.33-1.24)	0.181	7.00 (0.93-52.71)	0.059	1.94 (1.09-3.46)	0.024	2.95 (1.02-8.51)	0.046
Intrinsic renal disease								
No*	1		1		1		1	
Yes	0.52 (0.16-1.70)	0.281	0.78 (0.10-6.18)	0.810	1.28 (0.43-3.77)	0.655	0.66 (0.08-5.11)	0.687
Diabetes mellitus								
No*	1		1		1		1	
Yes	0.67 (0.37-1.22)	0.187	1.17 (0.39-3.55)	0.784	1.13 (0.66-1.92)	0.656	0.86 (0.36-2.01)	0.719
Non-HCC malignancy								
No*			1		1		1	
Yes	NA		1.50 (0.19-11.56)	0.700	0.47 (0.16-1.38)	0.169	0.37 (0.05-2.77)	0.329
Lung disease								
No*	1		1		1		1	
Yes	0.59 (0.24-1.44)	0.247	0.45 (0.13-1.62)	0.222	1.51 (0.68-3.37)	0.309	0.72 (0.17-3.16)	0.666
Smoking								
No*	1		1		1		1	
Yes	0.98 (0.58-1.68)	0.948	0.91 (0.38-2.19)	0.836	1.30 (0.83-2.06)	0.254	1.32 (0.66-2.63)	0.435
Hypertension								
No*	1		1		1		1	
Yes	2.04 (0.93-4.45)	0.074	2.48 (0.57-10.82)	0.228	0.64 (0.35-1.17)	0.146	0.45 (0.15-1.29)	0.497
Hepatic encephalopathy								
No*	1		1		1		1	
Yes	8.97 (3.51-22.92)	<0.001	0.48 (0.10-2.20)	0.341	6.70 (2.48-18.12)	<0.001	3.59 (1.23-10.48)	0.019
Diuretics								
No*	1		1		1		1	
Yes	8.27 (2.94-23.25)	<0.001	4.97 (1.90-12.98)	0.001	2.09 (1.34-3.26)	0.001	2.43 (1.25-4.74)	0.009
CP stage								
A*	1		1		1		1	
B	5.63 (2.44-13.01)	<0.001	9.13 (1.78-46.77)	0.008	2.66 (1.52-4.67)	0.001	2.45 (0.94-6.34)	0.067
C	12.84 (5.03-32.81)	<0.001	1.50 (0.55-4.11)	0.435	6.03 (2.97-12.27)	<0.001	6.83 (2.41-19.32)	<0.001
β-blockers								
No*	1		1		1		1	
Yes	3.35 (1.84-6.09)	<0.001	19.46 (2.59-146.05)	0.004	2.89 (1.79-4.66)	<0.001	0.38 (0.18-0.79)	0.010

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Supplementary Table 1 (Continued)

Characteristics	HE		HRS		Infection		SBP	
	OR (95%CI)	P-value	OR (95%CI)	P-value	OR (95% CI)	P-value	OR (95%CI)	P-value
PVT								
No*			1		1		1	
Yes	NA		5.82 (1.94-17.46)	0.002	0.39 (0.05-3.22)	0.383	1.41 (0.17-11.73)	0.753
HCC								
No*			1		1		1	
Yes	NA		0.88 (0.11-6.99)	0.907	0.36 (0.08-1.60)	0.178	0.60 (0.08-4.65)	0.625
Age (years)								
per unit	1.00 (0.98-1.02)	0.979	0.98 (0.95-1.01)	0.193	0.99 (0.97-1.01)	0.207	1.00 (0.97-1.02)	0.890
Plt								
per unit	1.00 (0.99-1.00)	0.106	1.00 (1.00-1.01)	0.334	1.00 (1.00-1.00)	0.439	1.00 (0.99-1.00)	0.231
PT								
per unit	1.10 (1.03-1.16)	0.003	0.98 (0.91-1.05)	0.532	1.03 (0.99-1.08)	0.144	1.02 (0.97-1.08)	0.406
INR								
per unit	5.61 (2.45-12.83)	<0.001	1.00 (0.48-2.08)	0.998	1.43 (0.89-2.30)	0.145	1.22 (0.83-1.81)	0.318
Sodium								
per unit	5.61 (2.45-12.83)	<0.001	1.04 (0.94-1.15)	0.482	0.97 (0.92-1.03)	0.336	0.91 (0.84-0.99)	0.023
Bilirubin								
per unit	1.10 (1.03-1.19)	0.008	1.00 (0.87-1.14)	0.943	1.11 (1.03-1.19)	0.007	1.07 (0.99-1.16)	0.090
Albumin								
per unit	0.57 (0.40-0.80)	0.001	0.60 (0.36-1.01)	0.053	0.61 (0.45-0.83)	0.001	0.57 (0.37-0.88)	0.010
Creatinine								
per unit	1,02 (0.73-1.42)	0.899	0.84 (0.58-1.22)	0.360	0.86 (0.57-1.29)	0.465	1.00 (0.64-1.57)	0.994
CP score								
per unit	1.56 (1.35-1.81)	<0.001	1.34 (1.08-1.66)	0.008	1.40 (1.24-1.59)	<0.001	1.49 (1.24-1.78)	<0.001
MELD score								
per unit	1.18 (1.11-1.25)	<0.001	0.94 (0.87-1.02)	0.114	1.08 (1.03-1.14)	0.001	1.08 (1.01-1.15)	0.026

* Reference category

The indication NA concerns associations in which no patient or small sample size met the examined criteria and thus the association between these variables could not be evaluated by means of regression

HE, hepatic encephalopathy; HRS, hepatorenal syndrome; SBP, spontaneous bacterial peritonitis; OR, odds ratio; CI, confidence interval; HCC, hepatocellular carcinoma; NA, not applicable; CP, Child-Pugh; PVT, portal vein thrombosis; Plt, platelets; PT, prothrombin time; INR, international normalized ratio; MELD, model for end-stage liver disease

Supplementary Table 2 Univariate analyses of factors correlating with the main comorbid disorders that accompany ascites progression in the group of patients with ascites grade 1

Characteristics	HE		HRS	
	OR (95%CI)	P-value	OR (95%CI)	P-value
Sex				
Female*			1	
Male	NA		1.27 (0.15-11.01)	0.829
Intrinsic renal disease				
No*			1	
Yes	NA		4.78 (0.39-58.02)	0.220

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Supplementary Table 2 (Continued)

Characteristics	HE		HRS	
	OR (95%CI)	P-value	OR (95%CI)	P-value
Diabetes mellitus				
No*	1		1	
Yes	1.00 (0.29-3.42)	>0.99	2.27 (0.52-9.83)	0.275
Non-HCC malignancy				
No*			1	
Yes	NA		4.67 (0.38-56.68)	0.227
Lung disease				
No*	1		1	
Yes	0.60 (0.12-2.94)	0.528	1.75 (0.33-9.33)	0.512
Smoking				
No*	1		1	
Yes	1.10 (0.42-2.89)	0.846	0.74 (0.20-2.73)	0.645
Hypertension				
No*	1		1	
Yes	0.87 (0.26-2.94)	0.823	1.06 (0.21-5.44)	0.945
Hepatic encephalopathy				
No*	1		1	
Yes	2.55 (0.30-21.54)	0.390	1.13 (0.13-10.05)	0.916
Diuretics				
No*	1		1	
Yes	2.98 (0.63-13.97)	0.167	3.04 (0.61-15.15)	0.175
CP stage				
A*	1		1	
B	0.27 (0.05-1.50)	0.134	0.59 (0.05-7.07)	0.676
C	0.65 (0.22-1.92)	0.437	1.35 (0.26-7.04)	0.725
β-blockers				
No*	1			
Yes	3.17 (0.98-10.23)	0.054	NA	
PVT				
No*				
Yes	NA		NA	
HCC				
No*				
Yes	NA		NA	
Age (years)				
per unit	0.97 (0.93-1.00)	0.079	1.00 (0.95-1.05)	0.985
Plt				
per unit	0.99 (0.99-1.00)	0.183	1.00 (0.99-1.01)	0.880
PT				
per unit	1.21 (1.03-1.43)	0.019	0.97 (0.72-1.31)	0.842

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Supplementary Table 2 (Continued)

Characteristics	HE		HRS	
	OR (95%CI)	P-value	OR (95%CI)	P-value
INR				
per unit	2.96 (0.66-13.33)	0.156	0.28 (0.02-4.30)	0.360
Sodium				
per unit	0.98 (0.86-1.12)	0.814	1.00 (0.83-1.20)	0.995
Bilirubin				
per unit	1.11 (0.99-1.25)	0.064	0.95 (0.76-1.18)	0.617
Albumin				
per unit	0.74 (0.33-1.64)	0.454	0.55 (0.17-1.79)	0.32
Creatinine				
per unit	0.78 (0.27-2.31)	0.659	1.11 (0.70-1.76)	0.670
CP score				
per unit	1.31 (0.99-1.73)	0.053	1.04 (0.71-1.52)	0.859
MELD score				
per unit	1.11 (1.00-1.23)	0.043	0.98 (0.85-1.14)	0.796

* Reference category

The indication NA concerns associations in which no patient or small sample size met the examined criteria and thus the association between these variables could not be evaluated by means of regression

HE, hepatic encephalopathy; HRS, hepatorenal syndrome; OR, odds ratio; CI, confidence interval; HCC, hepatocellular carcinoma; CP, Child-Pugh; PVT, portal vein thrombosis; Plt, platelets; PT, prothrombin time; INR, international normalized ratio; MELD, model for end-stage liver disease

Supplementary Table 3 Univariate Cox regression analysis for patients' survival

Characteristics	Total population		Ascites 1 group		Ascites 2/3 group		No ascites group	
	HR (95%CI)	P-value	HR (95%CI)	P-value	HR (95%CI)	P-value	HR (95%CI)	P-value
Group								
per unit	1.09 (0.86-1.28)	0.639	NA		NA		NA	
Sex								
per unit	0.96 (0.63-1.46)	0.849	1.43 (0.33-6.19)	0.633	1.26 (0.63-2.54)	0.512	0.75 (0.41-1.38)	0.355
Intrinsic renal disease								
per unit	2.25 (1.04-4.84)	0.039	25.96 (4.26-158.08)	<0.001	1.84 (0.65-5.16)	0.248	0.96 (0.13-7.03)	0.968
Diabetes mellitus								
per unit	1.63 (1.15-2.32)	0.006	1.57 (0.64-3.86)	0.325	1.68 (1.02-2.78)	0.043	1.48 (0.81-2.72)	0.201
Ischemic heart disease								
per unit	2.61 (1.26-5.41)	0.010	3.76 (0.47-30.00)	0.211	1.99 (0.71-5.61)	0.192	3.77 (1.13-12.62)	0.031
Non-HCC malignancy								
per unit	1.18 (0.58-2.41)	0.653	NA		3.16 (0.72, 13.80)	0.126	1.02 (0.43, 2.39)	0.970
Lung disease								
per unit	1.60 (0.88-2.89)	0.121	1.31 (0.49-3.45)	0.589	1.56 (0.48-5.02)	0.457	2.13 (0.76-5.99)	0.150
Smoking								
per unit	0.79 (0.58-1.09)	0.152	0.50 (0.24-1.02)	0.057	1.13 (0.68-1.89)	0.640	0.63 (0.36-1.09)	0.095
Hypertension								
per unit	1.24 (0.86-1.78)	0.247	1.33 (0.66-2.66)	0.427	1.08 (0.57-2.07)	0.811	1.28 (0.72-2.30)	0.400

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Supplementary Table 3 (Continued)

Characteristics	Total population		Ascites 1 group		Ascites 2/3 group		No ascites group	
	HR (95%CI)	P-value	HR (95%CI)	P-value	HR (95%CI)	P-value	HR (95%CI)	P-value
Hepatic encephalopathy								
per unit	0.65 (0.35-1.21)	0.174	0.73 (0.29-1.83)	0.504	0.32 (0.10-1.05)	0.061	0.48 (0.12-2.01)	0.317
Diuretics								
per unit	1.06 (0.74-1.51)	0.769	2.40 (0.95-6.06)	0.065	1.04 (0.30-3.70)	0.946	0.95 (0.56-1.62)	0.854
CP stage								
per unit	1.34 (1.03-1.74)	0.030	1.54 (0.85-2.79)	0.150	1.31 (0.77-2.22)	0.326	1.27 (0.63-2.55)	0.506
Varices								
per unit	1.19 (0.82-1.74)	0.359	1.68 (0.62-4.53)	0.304	1.06 (0.52-2.14)	0.877	1.33 (0.75-2.37)	0.328
PVT								
per unit	0.12 (0.03-0.44)	0.001	0.12 (0.03-0.44)	0.001	NA		NA	
HCC								
per unit	4.45 (1.21-16.37)	0.025	4.45 (1.21-16.37)	0.025	NA		NA	
β-blockers								
per unit	1.33 (0.97-1.82)	0.074	2.20 (0.96-5.04)	0.063	NA		NA	
Age (years)								
per unit	1.04 (1.02-1.05)	<0.001	1.05 (1.02-1.09)	0.005	1.03 (1.01-1.05)	0.003	1.04 (1.02-1.07)	0.001
Plt								
per unit	1.00 (1.00-1.00)	0.591	1.00 (0.99-1.00)	0.829	1.00 (1.00-1.01)	0.246	1.00 (1.00-1.00)	0.802
PT								
per unit	1.03 (0.99-1.06)	0.127	1.07 (0.95-1.20)	0.255	1.02 (0.95-1.11)	0.563	0.99 (0.90-1.09)	0.857
INR								
per unit	1.21 (0.89-1.65)	0.231	3.23 (0.93-11.22)	0.065	1.24 (0.52-2.93)	0.631	1.07 (0.55-2.06)	0.851
Sodium								
per unit	0.98 (0.94-1.02)	0.263	0.97 (0.88-1.07)	0.523	0.95 (0.89-1.02)	0.146	1.01 (0.95-1.08)	0.716
Bilirubin								
per unit	1.03 (0.98-1.09)	0.273	0.99 (0.89-1.10)	0.797	1.05 (0.97-1.13)	0.203	1.09 (0.95-1.25)	0.231
Albumin								
per unit	0.74 (0.59-0.93)	0.011	0.45 (0.23-0.88)	0.020	0.92 (0.62-1.35)	0.664	0.70 (0.50-0.99)	0.043
Creatinine								
per unit	1.16 (1.00-1.36)	0.057	1.35 (1.09-1.68)	0.007	1.20 (0.68-2.13)	0.528	1.06 (0.82-1.38)	0.641
CP score								
per unit	1.08 (0.99-1.18)	0.089	1.13 (0.90-1.41)	0.307	1.04 (0.88-1.23)	0.638	1.10 (0.87-1.41)	0.415
MELD score								
per unit	1.05 (1.01-1.09)	0.017	1.04 (0.96-1.13)	0.344	1.06 (1.00-1.13)	0.056	1.02 (0.95-1.09)	0.632

The indication NA concerns associations in which no patient or small sample size met the examined criteria and thus the association between these variables could not be evaluated by means of regression

HR, hazard ratio; CI, confidence interval; HCC, hepatocellular carcinoma; CP, Child-Pugh; PVT, portal vein thrombosis; Plt, platelets; PT, prothrombin time; INR, international normalized ratio; MELD, model for end-stage liver disease